

SUB A1

WHAT IS CLAIMED IS:

1. An image pickup apparatus comprising:
a ring member for driving a lens ;
detection means for detecting a change amount of
rotation of said ring member;
control means for performing motion/stop control
of at least a lens group along an optical axis in
accordance with a detection result by said detection
means; and
- 10 motion direction setting means for allowing a user
to set as desired the motion direction of the lens
group relative to the rotation direction of said ring
member.
- 15 2. An image pickup apparatus according to claim
1, wherein the lens group includes a magnification lens
and said motion direction setting means comprises:
an operation switch capable of being operated by
an user; and
- 20 change means for changing the motion direction of
the lens group relative to the rotation direction of
said ring member in accordance with the operation state
of said operation switch.
- 25 3. An image pickup apparatus according to claim
2, wherein a lens unit is made removable relative to
the main body of the image pickup apparatus.
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4 An image pickup apparatus according to claim
3, wherein said ring member is disposed concentrically
about an optical axis of said lens group.

5 5. An image pickup apparatus according to claim
1, wherein the lens group includes a magnification lens
and said motion direction setting means comprises:

10 memory means for storing motion direction
information of the lens group relative to the rotation
of said ring member, the motion direction being given
by a user; and

change means for changing the motion direction of
the lens group in accordance with the motion direction
information stored in said memory means.

15 6. An image pickup apparatus according to claim
5, wherein a lens unit is made removable relative to
the main body of the image pickup apparatus.

20 7. An image pickup apparatus according to claim
6, wherein said ring member is disposed concentrically
about an optical axis of said lens group.

25 8. An image pickup apparatus according to claim
1, wherein said motion direction setting means
comprises:

a menu function control unit for controlling a

character generator in accordance with the operation state of menu setting means operated upon by a user and displaying a predetermined menu on a display screen of display means; and

5 setting means for selecting a desired setting item among a plurality of items displayed on the predetermined menu and setting a condition regarding the motion direction of the lens group.

10 *Sab B2* 9. An image pickup apparatus according to claim 8, wherein a lens unit is made removable relative to the main body of the image pickup apparatus.

15 *C M* 10. An image pickup apparatus according to claim 9, wherein said ring member is disposed concentrically about an optical axis of said lens group.

20 11. An image pickup apparatus according to claim 1, wherein a lens unit is made removable relative to the main body of the image pickup apparatus.

25 12. An image pickup apparatus according to claim 11, wherein said ring member is disposed concentrically about an optical axis of said lens group.

13. An image pickup apparatus according to claim 1, wherein said ring member is disposed concentrically

15 about an optical axis of a lens unit.

5 14. An image pickup apparatus wherein:
detection means detects a change amount of
rotation of a ring member for driving a lens; and
control means provided with a plurality of
characteristics for determining a correlation between
an output of said detection means and a motion of a
magnification lens, controls motion/stop of at least
10 the magnification lens along an optical axis in
accordance with an output of said detection means.

15 15. An image pickup apparatus according to claim
14, wherein the plurality of characteristics of said
control means include a first characteristic for
controlling a motion amount of the magnification lens
per unit rotation of at least the ring member to be
constant and a second characteristic for controlling a
motion speed of the magnification lens to be variable
20 in accordance with a rotation speed of the ring member.

16. An image pickup apparatus according to claim
14, wherein the plurality of characteristics of said
control means include a first characteristic for
controlling a motion amount of the magnification lens
per unit rotation of at least the ring member to become
25 a first predetermined amount and a second

characteristic for controlling a motion amount of the magnification lens per unit rotation of the ring member to become a second predetermined amount different from the first predetermined amount.

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17. An image pickup apparatus wherein:
detection means detects a change amount of
rotation of a ring member for driving a lens; and
control means providing a plurality of
characteristics each settable by a user for determining
a correlation between an output of said detection means
and a motion of a magnification lens, controls
motion/stop of at least the magnification lens along an
optical axis in accordance with an output of said
detection means.

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18. An image pickup apparatus according to claim
17, wherein the plurality of characteristics of said
control means include a first characteristic for
controlling a motion amount of the magnification lens
per unit rotation of at least the ring member to be
constant and a second characteristic for controlling a
motion speed of the magnification lens to be variable
in accordance with a rotation speed of the ring member.

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19. An image pickup apparatus according to claim
18, wherein the characteristic of said control means is

changed in accordance with the state of an operation switch capable of being operated upon by a user.

20. An image pickup apparatus according to claim
5 18, wherein the characteristic of said control means is changed in accordance with information of the characteristic of said control means set by a user.

21. An image pickup apparatus according to claim
10 18, wherein the characteristic of said control means is changed in accordance with a photographing state.

22. An image pickup apparatus according to claim
15 17, wherein the plurality of characteristics of said control means include a first characteristic for controlling a motion amount of the magnification lens per unit rotation of at least the ring member to become a first predetermined amount and a second characteristic for controlling a motion amount of the magnification lens per unit rotation of the ring member to become a second predetermined amount different from the first predetermined amount.

28. An image pickup apparatus according to claim
25 22, wherein the characteristic of said control means is changed in accordance with the state of an operation switch capable of being operated upon by a user.

24. An image pickup apparatus according to claim 22, wherein the characteristic of said control means is changed in accordance with information of the characteristic of said control means set by a user.

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25. An image pickup apparatus according to claim 22, wherein the characteristic of said control means is changed in accordance with a photographing state.

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26. An image pickup apparatus having an image pickup apparatus main body and a lens unit, comprising: detection means for detecting a change amount of rotation of a ring member disposed concentrically about a lens optical axis; and

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control means provided with a plurality of characteristics for determining a correlation between an output of said detection means and a motion of a magnification lens,

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wherein said control means controls motion/stop of at least the magnification lens along the optical axis in accordance with an output of said detection means.

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27. An image pickup apparatus according to claim 26, wherein the plurality of characteristics of said control means include a first characteristic for controlling a motion amount of the magnification lens per unit rotation of at least the ring member to be

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constant and a second characteristic for controlling a motion speed of the magnification lens to be variable in accordance with a rotation speed of the ring member.

5 28. An image pickup apparatus according to claim
26, wherein the plurality of characteristics of said
control means include a first characteristic for
controlling a motion amount of the magnification lens
per unit rotation of at least the ring member to become
10 a first predetermined amount and a second
characteristic for controlling a motion amount of the
magnification lens per unit rotation of the ring member
to become a second predetermined amount different from
the first predetermined amount.

15 29. An image pickup apparatus comprising:
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 detection means for detecting a change amount of
 rotation of a ring member disposed concentrically about
 a lens optical axis;

20 control means provided with a plurality of
 characteristics for determining a correlation between
 an output of said detection means and a motion of a
 magnification lens; and

 setting means for a user to set the characteristic
25 of said control means,

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 wherein a motion/stop of at least the
 magnification lens is controlled along the optical axis

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in accordance with an output of said detection means.

30. An image pickup apparatus according to claim 29, wherein the plurality of characteristics of said control means include a first characteristic for controlling a motion amount of the magnification lens per unit rotation of at least the ring member to be constant and a second characteristic for controlling a motion speed of the magnification lens to be variable in accordance with a rotation speed of the ring member.

31. An image pickup apparatus according to claim 30, further comprising:
an operation switch capable of being operated upon by a user; and
change means for changing the characteristic of said control means in accordance with a state of said operation switch.

32. An image pickup apparatus according to claim 31, wherein said change means changes the characteristic of said control means in accordance with information of the characteristic of said control means set by a user.

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33. An image pickup apparatus according to claim 32, wherein said change means changes the

characteristic of said control means in accordance with
a photographing state.

34. An image pickup apparatus according to claim
5 29, wherein the plurality of characteristics of said
control means include a first characteristic for
controlling a motion amount of the magnification lens
per unit rotation of at least the ring member to become
a first predetermined amount and a second
10 characteristic for controlling a motion amount of the
magnification lens per unit rotation of the ring member
to become a second predetermined amount different from
the first predetermined amount.

15 *Seku*
61 35. An image pickup apparatus according to claim
34, further comprising:
an operation switch capable of being operated upon
by a user; and
change means for changing the characteristic of
20 said control means in accordance with a state of said
operation switch.

36. An image pickup apparatus according to claim
35, wherein said change means changes the
25 characteristic of said control means in accordance with
information of the characteristic of said control means
set by a user.

37. An image pickup apparatus according to claim
36, wherein said change means changes the
characteristic of said control means in accordance with
a photographing state.

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38. An image pickup apparatus according to claim
26, wherein the lens unit is removable mounted on the
image pickup apparatus main body.

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39. A storage device storing programs, the
programs comprising:

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a detection module for executing a detection
process of detecting a change amount of rotation of a
ring member disposed concentrically about a lens
optical axis;

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a control module for executing a control step by
control means provided with a plurality of
characteristics for determining a correlation between
an output of said detection means and a motion of a
magnification lens, the control step controlling
motion/stop of at least the magnification lens along
the optical axis in accordance with a detection output
from said detection module.

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40. An image pickup apparatus according to claim
14, wherein the ring member is disposed concentrically
about said lens group.

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41. An image pickup apparatus according to claim
17, wherein the ring member is disposed concentrically
about said lens group.

Sub 31
5 42. An image pickup apparatus comprising:
Sub 31
a ring member disposed concentrically about a lens
optical axis of a lens unit;
detection means for detecting a change amount of
rotation of said ring member;
control means for performing motion/stop control
of at least a magnification lens group along the
optical axis in accordance with a detection result by
said detection means; and
inhibition means for inhibiting the magnification
15 lens to stop during a predetermined period after said
ring member stops rotating.

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20 43. An image pickup apparatus according to claim
42, wherein the lens unit is removably and exchangeably
mounted on a main body of the image pickup apparatus.

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25 44. An image pickup apparatus comprising:
a ring member disposed concentrically about a lens
optical axis of a lens unit;
detection means for detecting a change amount of
rotation of said ring member;
control means for determining motion direction and

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speed of a magnification lens group in accordance with an output of said detection means and performing motion/stop control of the magnification lens group along the optical axis; and

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change means for changing a response characteristic of the motion of the magnification lens group relative to a detection result of said detection means between a motion start time state and a motion state of the magnification lens group.

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45. An image pickup apparatus according to claim 44, wherein said lens group is removably and exchangeably mounted on a main body of the image pickup apparatus.

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46. An image pickup apparatus according to claim 44, wherein said change means changes a reference value of a change amount of rotation of said ring member for permitting/inhibiting the motion of the magnification lens group.

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47. An image pickup apparatus according to claim 44, wherein said change means changes the motion speed of the magnification lens group relative to an output 25 of said detection means.

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48. An image pickup apparatus comprising:

a ring member disposed concentrically about a lens optical axis;

detection means for detecting a change amount of rotation of said ring member;

control means for determining motion direction and speed of a magnification lens group in accordance with an output from said detection means and performing motion/stop control of the magnification lens group along the optical axis; and

change means for changing a response characteristics of the motion of the magnification lens group relative to a detection result of said detection means in accordance with a photographing state.

15 *Set 6* 49. An image pickup apparatus according to claim 48, wherein said lens group is removably and exchangeably mounted on a main body of the image pickup apparatus.

20 *48* 50. An image pickup apparatus according to claim 44, wherein said change means changes the motion speed of the magnification lens group relative to an output of said detection means.